THE USE OF COMPUTER-DISPLAYED SOCIAL STORIES TO IMPROVE SOCIAL SKILLS FOR A CHILD WITH AUTISM: A CASE STUDY

THESIS

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by

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ABSTRACT

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This study examined the effectiveness of teaching social skills to a child with autism using a computer-displayed social story presentation. A single-subject, multiple baselines across behaviors approach was used to evaluate the effectiveness of three computer-displayed social stories to teach replacement behaviors. The participant in this study was an eleven-year old fourth grade boy with autism. The study was conducted in a school setting, both in the regular education and resource rooms. Carol Gray's format was used as a guideline for writing the social stories. Digital pictures of the subject that corresponded to the text were inserted into the Microsoft PowerPoint software to create a computer-displayed slideshow of each social story. The social stories were introduced in three different phases approximately seven to ten days apart and data were collected on all three behaviors during each phase. The researcher's analyses of the data revealed that the computer-displayed social stories intervention was effective in teaching replacement behaviors to this child with autism.

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CHAPTER 1

Introduction

The Diagnostic and Statistical Manual of Mental Disorders, Text Revision (American Psychiatric Association, 2000) characterizes autism using three criteria: "impairment in social interaction, impairment in communication, and restricted repetitive and stereotyped patterns of behavior, interests, and activities" (p. 75). Kanner described autism in the 1940's as a need for extreme social isolation, an inability to relate to people, a need for sameness, and mutism or noncommunicative speech (Wenar & Kerig, 2000). Rudrud (1998) defines autism as "a behaviorally defined syndrome characterized by an uneven developmental profile and disturbances in social interaction, communication, and perceptual organization. Autism is one of several disorders included in the spectrum of behaviors that makes up the category of Pervasive Developmental Disorders" (p. 567). Science, technology, and our human curiosity in the past sixty years have led us down a fascinating journey as we look for the answers and perhaps the key to help us better understand the world of those who have autism. The purpose of this research is to explore the use of three computer-displayed social stories to increase appropriate behavior for one student with autism.

Autism

Our society is changing and so are our children and their problems. Autism has become the topic of news stories, magazine articles, and conversations in the educational setting. Current statistics indicate that the prevalence of children and adults diagnosed with autism has risen in the past several years from 4-5 per 10,000 to as high as 10-20 per 10,000 (Edelson, 1997; Fitton & Ford, 1998; Ikeda, 2002). This increase in the prevalence of autism may be due in part to the broadening of definitions and characteristics associated with this psychopathology (Wenar & Kerig, 2000; Croen, Grether & Selvin, 2002). Asperger's Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Fragile X Disorder, and Autism all fall under the umbrella of disorders known as Pervasive Developmental Disorders (American Psychiatric Association, 2000). The increase in the incidence of autism can be attributed, at least in part, to the lumping of diagnoses under Pervasive Developmental Disorders.

Although no cause for autism has been found to date (American Academy of Child and Adolescent Psychiatry, 1999; Edelson, 1999), a number of studies have been conducted to find possible links. Research suggests that children of multiple births, an increase in maternal age (Croen, Grether & Selvin, 2002), genetics, depression and/or dyslexia on both sides, exposures to viruses such as rubella and cytomegalo during the first trimester of a pregnancy, dysfunctions in the neural structure of the brain and chemistry of the brain, and exposure to environmental toxins (Edelson, 1999; Autism Society of America, 2003) are possible causes of autism. The Autism Society of America

(2003) reported that in 2001, an investigation conducted by the Institute of Medicine stated "they could not rule out the possibility that the MMR vaccine could contribute to autism spectrum disorder in a small number of children" (p. 1). Males are three to four times more likely to be affected with autism than females (Edelson, 1999; American Academy of Child and Adolescent Psychiatry, 1999; Rudrud, 2000).

Autism usually develops in the first two and one half to three years of life (American Psychiatric Association, 2000; Rudrud, 2000). Some children will appear to be developing normal communication and social patterns and around two years of age there is a marked change in development. For example, children may have acquired a repertoire of words and then suddenly loose the words. In other cases, infants display autistic like characteristics from birth. Infants diagnosed with autism may not want to be cuddled or ever reciprocate a smile with their parent or caregiver. In some instances, an infant may actually arch its back or even stiffen and resist affection from another person. On the other hand, there are infants who will only cling to one other individual. Most disconcerting is the fact that infants diagnosed with autism are unable to develop normal social relations with others, including their parents. Approximately 76 to 86 percent of children with autism have intelligence test scores that fall below 70 (Wernar & Kerig, 2000).

Although the words may be slightly different, three predominant categories are used in all the definitions to describe the characteristics related to autism. These categories are deficits in communication skills, social skills, and

repetitive or stereotyped patterns of behavior. The following characteristics are found across the board when behaviors of children with autism are described. Social deficits most commonly observed in children with autism include inappropriate laughing or giggling, a preference to be alone, inability to develop friendships, inability to read social cues, avoidance of eye contact, limited awareness of social boundaries, difficulty learning and following rules and a general preference for playing alone. Children with autism's preference for social isolation is one of the most striking characteristics of their psychopathology and much research related to this characteristic has been conducted (Wenar & Kerig, 2000).

Children with autism also may be unable to talk or may have difficulty expressing their needs, may not understand what is being said to them and may speak a language all of their own. In many cases the tone of a child's speech is sing-song, monotone, or too fast/slow. Often, children with autism will exhibit verbal rituals, may use echolalia beyond developmentally appropriate age, (echoes words or phrases) and may have difficulty sustaining a conversation with another person, even though they may have adequate speech.

Unusual and repetitive behaviors such as spinning self or objects, lining up objects and a preoccupation with one interest such as computer games or cartoon characters are typical. Children diagnosed with autism often have an insistence on sameness and are resistant to change. If their schedules or routines are changed, even in a very small way, children with autism may

become highly distressed, often resulting in aggressive behavior. Finally, many children diagnosed with autism have unusual responses to sensory experiences. Some children with autism have reported that various noises and loud voices hurt their ears. Others feel comfort from applied pressure to different parts of the body. Although these behaviors are often used as criteria for diagnosing children with autism, not all children diagnosed with autism exhibit all of the above behaviors. According to the Autism Society of America (2003), "many children with autism do make eye contact, show affection, smile and laugh, and demonstrate a variety of other emotions, although in varying degrees" (p. 1). Thus, the behavioral social characteristics that are displayed by those who have been diagnosed with autism are varied and must be addressed individually (p. 84).

The Individuals with Disabilities Education Act of 1997 (Public Law, 105-17) specifies autism as one of a number of specific learning problems that offer protection by law to students who have been diagnosed with autism. Autism is defined as:

> A developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3, that adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

Social Stories

Given the rise in the diagnoses of autism and other related disorders, educational institutions have been faced with new challenges in educating and including children with autism in the regular education setting. As a result of these challenges, many techniques and interventions have been developed to help the child with autism in the school setting. As discussed earlier, children with autism often are lacking in the social skills that most people acquire without direct instruction. One particular area of research and instructional application is the teaching of social skills to students with autism. Myles & Simpson (2001) refer to this way of teaching as the "hidden curriculum." Others refer to this phenomenon as "theory of mind". Theory of mind, as defined by Edelson (1999), is "one's ability to realize that other people have their own unique point of view about the world" (p. 6). Children with autism often need to be taught other people's perspectives in a variety of situations, such as what to say and not to say to teachers, principals, police, and other students. Actions such as greeting another adult or gaining another person's attention are often foreign to the inner world of a child with autism. These social skills are based on the rules that govern the social world, and the lack of them may often cause much conflict, alienation, and confusion for the child diagnosed with autism.

A variety of instructional and behavioral approaches can be used to teach children who fall under the umbrella of autism social rules and an understanding of others' perspectives. However, given the wide variety of

characteristics and symptoms of individuals with autism, it is difficult to develop any single treatment or intervention that would work for all children (Del Valle, McEachern & Chambers, 2001). Scope and sequence, social autopsies, cartooning, social stories, comic strip conversations, thinking stories and situations, options, consequences, choices, strategies, and simulation (SOCCSS) are some strategies being implemented to teach social rules (Gray, 1994; Myles & Simpson, 2001). This researcher has elected to examine the effectiveness of using social stories to teach social rules.

The social story has proven to be an effective social skills intervention to teach social skills for people identified with an autistic spectrum disorder. A social story describes a social situation in terms of pertinent social cues and identifies suitable responses for the individual (Gray, 1994; Swaggart & Gagnon, 1995; Simpson & Myles, 1998; Norris & Dattilo, 1999; Rowe, 1999; Rogers & Myles, 2001; Del Valle, McEarchern & Chambers, 2001; Lorimer, Simpson, Myles & Ganz, 2002). Carol Gray has written many articles and books on developing and teaching social stories to children with autism. Gray (2002) defines a social story as:

> A process that results in a product for a person with an autistic spectrum disorder (ASD). First, as a process, a Social Story requires consideration of – and respecting the perspective of the person with ASD. As a product, a Social Story is a short story – defined characteristics – that describes a situation, concept or social skill using a format that is meant for people with ASD. (p. 1)

A social story is usually written in the first person perspective of the ADS child, written in a positive tone, and has a title that expresses the main idea of the story.

In creating a social story it is useful to include a ratio of two to five descriptive, perspective, and affirmative sentences to one directive sentence (Gray, 2002). A descriptive sentence is a statement of fact and the main idea of the story. A perspective sentence is used to share the internal thoughts of others with the child when a behavior occurs. The purpose of the perspective sentence is to help the child better understand. Children with autism have a difficult time understanding another person's feelings, beliefs, opinions, and motivations. An affirmative sentence is a sentence that usually states a value shared by many in a culture. Finally, a directive is a statement that directs the child's behavior. Much care needs to be taken to make sure this sentence is written so that the child does not take it too literally.

Hagiwara and Myles (1999) used a computer-displayed social story as an intervention strategy for eliciting behavior changes in three elementary students with autism. The target behavior for two of the students was hand washing and the third student's goal was to increase on-task behavior. Results of the data analyzed indicated that the computer-displayed social story increased the skills of some of the students in some of the settings. Both of the students whose target behavior was hand washing showed improvement, with the first demonstrating 100% completion of the task after two intervention sessions. The student whose on-task behavior was problematic showed no

stable improvement. Self-stimulatory behaviors such as touching or pulling his hair, tapping the table with his hand, and erratic eye movement caused the third student to have problems staying focused on the social skill's instruction. Limitations of this study included the short duration of the intervention period and a lack of consistency in the environments in which the interventions were conducted.

Using computer-displayed interventions can motivate many children, including children with autism, to change behaviors that are interfering with their learning in and out of school. Computer-aided learning (CAL) for people with autism has endless possibilities. Using the computer as a vehicle to create interventions that are specific to the unique strengths and weakness of each child with autism is promising. Social rules can be taught directly using both visuals and words in a variety of formats. A multi-media format allows graphics to be manipulated to add meaning to the text, to make the program pause, and to be used over and over by the student (Moore, McGrath & Thorpe, 2000). Unfortunately, teaching children with autism via the computer has been relatively unexplored (Moore, McGrath & Thorpe, 2000). To date, the study conducted by Hagiwara and Myles (1999) is the only study this researcher could find that used a computer-displayed presentation to teach social skills to children diagnosed with autism.

Some cautions should be noted when working with children diagnosed with autism via the computer (Moore, McGrath & Thorpe 2000). First, children with autism lack communication skills needed to interact with others. These

children should be afforded many opportunities to practice these social skills in the presence of other people. Teaching these skills via a computer could take away such experiences. Children with autism can take things very literally and much caution needs to be taken with the words that are used to teach social skills. In addition, the use of the computer as an intervention should not be used to fill up a child's time, but must reinforce the skills being taught. Finally, if using the computer as a medium is a distraction in and of itself, then presenting a social story in this format is not recommended.

According to the literature (Swaggart & Gagnon, 1995; Simpson & Myles, 1998; Hagiwara & Smith, 1999; Rowe, 1999; Rogers & Myles, 2001; Del Valle, McEarchern & Chambers, 2001; Mirenda, 2001; Lorimer, Simpson, Myles & Ganz, 2002) more research, supported by empirical data, is needed on the effectiveness of social stories to teach social skills to children with autism and other autistic spectrum disorders. Children with autism are usually better at tasks that require visual-spatial and nonverbal skills (Wenar & Kerig, 2000). The computer provides a medium for children with autism to use their visual-spatial skills to learn a variety of social skills. Furthermore, research has found that most children with autism have a visual learning style and usually learn more effectively when new information is presented in this fashion (Kuttler, Myles &Carlson, 1998). In this researcher's experience, children with autism seem to be motivated by being able to use the computer to learn. Using the computer as a vehicle to provide digital pictures of a child performing a specific

behavior or including pictures to add meaning to the text of a social story are viable options for teaching social skills.

The primary purpose of this study was to expand the research (Hagiwara and Myles, 1999) on the effectiveness of teaching social skills using the computer-displayed social story presentation. Specifically, this study examines the effectiveness of using computer-displayed social stories to teach a subject diagnosed with autism replacement behaviors for three targeted behaviors. Carol Gray's format was used as guide in creating the social stories. However, a slightly different format using the Microsoft PowerPoint software was used to create a social skills slideshow by inserting digital pictures, text and sound.

CHAPTER II

Method

Design

A single-subject, multiple baseline across behaviors design was used to evaluate the effectiveness of three different computer-displayed social stories on three target behaviors of a child diagnosed with autism. A with-in subjects approach was used to target the three dependent variables: invasion of others' personal space, inappropriate touching, and greeting behaviors. Baseline data were collected on all three behaviors for approximately five to nine days. The first social story to be introduced to the child focused on inappropriate touching. At the same time, frequency counts were continually collected on all three behaviors to see if any difference in baseline patterns was noted in non-targeted behaviors. Using the same procedures, the second social story on invasion of others' space was introduced seven days later and the third social story on greeting behaviors was introduced ten days after the second story.

Participant

An eleven-year old boy, who has been diagnosed as having autism (higher functioning), was the participant in this study. The subject was chosen for this study for three reasons. First, this subject was identified, by the special education teacher, as a child who would benefit from an intervention to reduce the following inappropriate behaviors: invasion of other's personal space,

touching adults, and greeting behaviors. Second, this subject met the criterion specified in the *Diagnostic Statistical Manual, 4th Edition, Text Revision* to be diagnosed as having autism (American Psychiatric Association, 2000). Third, the subject scored a Full Scale IQ of 71 on the *Wechsler Intelligence Scale for Children-Third Edition (WISC-III)*, in the range of scores considered low average and mildly delayed. In Gray's (1994) experiences with using social stories, higher functioning children diagnosed as having autism have a higher probability of experiencing success with the social story intervention. The effectiveness of the social story intervention with a lower functioning child with autism was evaluated to determine whether social stories could be used for a broader range of students.

Materials

This study was conducted in a suburban school located in Southwest Ohio. The school services approximately 1,960 students in grades four through six. Data collection and the implementation of the intervention took place in both the regular education setting and in the resource room.

The experimental treatment included the use of three computer-displayed social stories to reduce inappropriate behaviors by teaching replacement behaviors. A social story describes a social situation in terms of pertinent social cues and identifies suitable responses for the individual. The following steps were followed in the development of the three social story interventions:

1. The researcher and special education teacher analyzed the subject's behaviors to determine targeted behaviors. The behaviors identified at

first were very broad and then narrowed to three very specific behaviors: inappropriate touching, invasion of others' space and inappropriate touching.

1. Replacement behaviors were identified for each targeted behavior. For example, when working with an adult, the participant would put his hand on the desk instead of on the adult.
2. The writing of the social story was the most important part of the development of the social story intervention. Care was taken to ensure that each word and statement written was appropriate to the student and the social skill being taught. Gray's (2002) format was used as a guideline for writing the social story.
3. Digital pictures of the subject that corresponded to the text in the social story were taken. The digital pictures included individuals and items that were familiar and meaningful to the subject.
4. Using the Microsoft Powerpoint software, a social skills slideshow was created by inserting digital pictures, text and a screeching "stop" sound. One to two sentences were presented on each slide, accompanied by digital pictures that related to the text. Digital pictures of the participant were inserted into the slideshow to help cue the subject on what to do in a particular social situation (Appendix A).

Procedure

The three dependent variables were the frequency of inappropriate touching, invasion of personal space, and inappropriate greeting behaviors. These behaviors were reported by the special education teacher to be concerns for this particular student. For example, when an adult was sitting next to the

student, assisting him with his work, the student would rub the adult's back or arm. On one particular occasion, the student inappropriately snapped the adult's bra strap. Other times, the student insisted on holding hands with the adult, while working on schoolwork. Another concern had to do with invasion of others' personal space. The student tended to stand or sit too close to adults. This often resulted in the adult feeling uncomfortable. Another concern was when the student greeted an adult at school. Third, the student frequently raised his voice and called an adult by his or her first name or put his arms around the adult.

The variable of inappropriate touching was defined as rubbing the back or arm of an adult while sitting next to him or her, and holding the adult's hand. The variable of invasion of others' personal space was defined as the failure to maintain at least one arm's length between the child and an adult. The third variable, greeting, was defined as the child's inability to appropriately gain an adult's attention in an initial meeting by calling the adult by his or her first name or putting the child's arm around the adult. The instructional aide used a tally mark (Appendix C) to indicate the number of times the subject displayed inappropriate touching, space, and greeting behaviors. Data on these behaviors were collected each school day from 9:50-12:00 in the regular education setting throughout the course of the study, both to obtain baseline data and progress-monitoring measures. The following steps were used to guide the implementation of the intervention:

1. The social stories were submitted to a three-person panel to verify content validity (Appendix A).
2. The instructional aide was trained to collect baseline data using the following guidelines:

   Each time the subject displayed inappropriate behavior toward an adult, the instructional aide made a tally mark on a chart (Appendix C). Inappropriate touching was defined as rubbing an adult's back, arm or holding an adult's hand at school. Invasion of personal space was defined as the subject's failure to maintain at least one arm's length between himself and an adult at school. Greeting was defined as gaining an adult's attention in an initial meeting by using the adult's first name or by putting the child's arm around the adult. The researcher graphed the data until a baseline pattern was established.
3. The special educator introduced the social story by reading it to the participant and modeling the preferred behaviors, making sure the subject understood what it meant. In addition, the subject was taught to manipulate the buttons in order to read and view the show independently. The social stories were introduced in three phases, in the following order: Appropriate Touching, Respect for Others' Personal Space, and Appropriate Greeting Behaviors.
4. The special educator made sure that the subject viewed the social story two times each day.

5. Coaching and modeling of the appropriate social behaviors were included with the implementation of the intervention by the special educator, regular education teacher and instructional aide who interacted with the child at school. Verbal prompts and actions were used to encourage the subject to use appropriate greeting behaviors. For example, the teacher used the verbal prompt "say Miss, Mrs. or Mr.," followed by the last name, and "say 'hi' when you want to greet an adult." In addition, the teachers were instructed to use physical redirection if the subject violated the one arm's length rule with an adult.
6. The instructional aide collected data on the number of inappropriate behaviors observed each school day from 9:50-12:00 in the regular education setting.
7. Consent was ensured before the study began (Appendix B).

CHAPTER III

Results

Three computer-displayed social stories used to teach replacement behaviors were effective when shown to a child with autism. Figures 1, 2 and 3 display the data collected during each phase of the social story intervention. As shown during baseline, the mean frequency of inappropriate touching was 3.8 during a five day period. The mean frequency baseline for invasion of others' space was 1.17 during a twelve day period and the mean frequency baseline for greeting adults was .45 during a twenty-two day period. Effect size was used to analyze the effectiveness of the social story intervention (Busse, Kratochwill and Elliott, 1995). Effect size was calculated for each social story intervention by subtracting the baseline mean from the intervention mean and dividing that result by the standard deviation of the baseline data points.

When the touching social story was introduced, inappropriate touching decreased from the baseline mean of 3.8 to achieve a large effect size of .828 during a twenty-seven day intervention period. Second, when the invasion of others' space social story was introduced, invasion of others' space decreased from a mean baseline of 1.17 to achieve a medium effect size of .626 during a twenty day intervention period. Lastly, when the greeting social story was introduced, inappropriate greeting decreased from a mean baseline of .45 to achieve a medium effect size of .495 during a ten day period. Interestingly, all

behaviors decreased after the introduction of each social story, eventually diminishing to no occurrences of targeted behaviors during the last ten days data was collected.

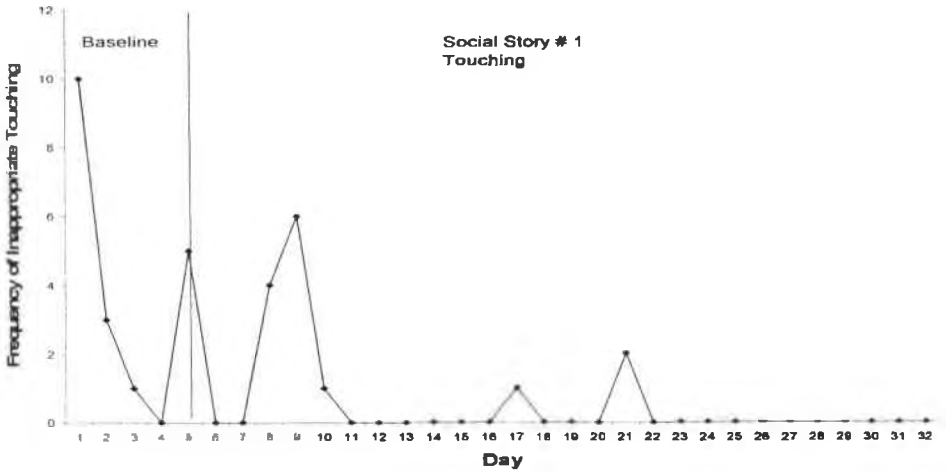

FIGURE 1. Frequency of inappropriate touching.

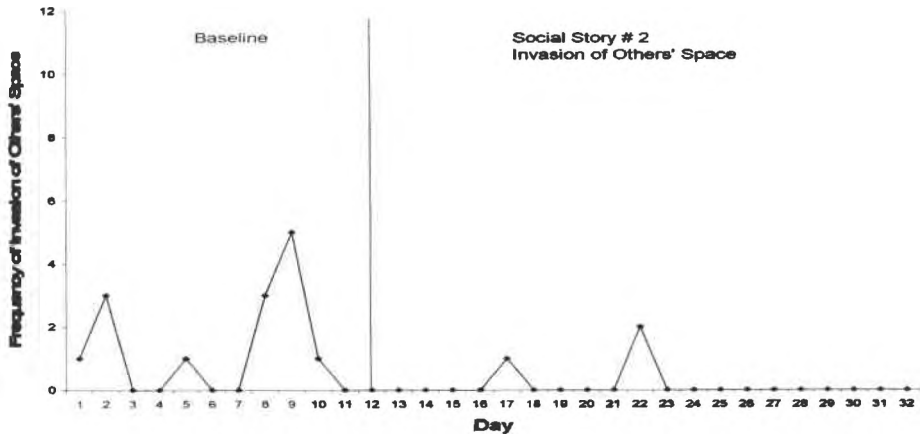

FIGURE 2. Frequency of invasion of others' space.

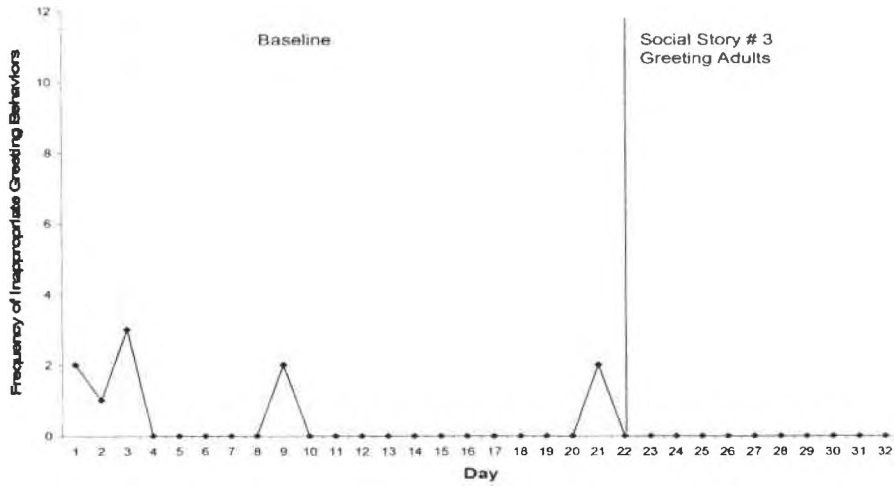

FIGURE 3. Frequency of inappropriate greeting behaviors.

Discussion

The use of three computer-displayed social stories to decrease inappropriate touching, greeting, and invasion of others' space, by teaching replacement behaviors, was effective when used with an eleven year old boy diagnosed with autism. All targeted behaviors decreased in frequency after the respective social stories were introduced. Furthermore, the targeted behaviors continued to decrease in frequency after each social story intervention was introduced. In this study the keystone behavior of inappropriate touching was related to each new social skill being taught, and therefore, it is difficult to delineate if the first social story reinforced the skills being taught in the second and third social stories. When developing social stories for students, it is important to determine the most critical skill and examine what the effects of that skill will have on other social skills being introduced. Treatment integrity was ensured

through periodic observations of the special educator implementing the social story interventions and the training of the instructional aide to collect data.

According to Gray's experience (1994), social stories used to teach social skills are most effective with the higher intellectually functioning child with autism. The subject in this study was a lower intellectually functioning child with autism and the social story intervention was proven to be effective. It is difficult to determine if this was due to the computer-displayed presentation of the social story. However, further research in comparing the effectiveness of computer-displayed social stories with paper-displayed social stories with lower functioning children with autism would be interesting.

Two important factors added to the success of the computer-displayed social story interventions. First was a special education teacher that worked collaboratively with the researcher, homeroom teachers, instructional aide and the student to ensure the success of the social story intervention. The special education teacher made sure that the student viewed the story twice daily and reinforced the replacement behaviors frequently. In addition, other teachers and professionals that came into contact with the subject also reinforced the appropriate behaviors being taught.

Second, the use of digital pictures of the subject demonstrating the appropriate replacement behaviors was an effective visual method to enhance the communication of the skill being taught. Pictures taken of the subject included the subject's environment, interests and people in his school setting. As mentioned earlier, children with autism often have difficulty understanding

the perspective of others. When creating a picture to reinforce the perspective of others, pictures of teachers or peers familiar to the subject were used to communicate that message. One example would be the use of pictures of the subject's classmates to illustrate how fourth grade students appropriately greet an adult. As stated previously, most children with autism have a visual learning style and, usually, learn more effectively when new information is presented in this fashion (Kuttler, Myles & Carlson, 1998). Using digital pictures helps create a more relevant social story that is unique to each child with autism. It is this researcher's opinion that the success of this social story intervention was produced by the combined effects of the computer-displayed social stories and the reinforcing interactions with familiar others.

Although the purpose of this research was to examine the effectiveness of the use of social stories in teaching appropriate behaviors to a child with autism, this intervention could benefit a variety of students who are in need of learning social skills. For example, a student who is having trouble learning the morning routine may display problem behaviors during this time. The teacher could create a slideshow with pictures of the child completing each step of the morning routine. Most educators know that the best way to learn a concept is to teach the concept. Students in need of social skills training could create their own social skills slideshow. Creating computer-displayed slideshows could be a class-wide project in which the assignment would be to choose a behavior that is a problem in the classroom. The possibilities are endless in regard to

how and for whom computer-displayed social stories could be used to teach social skills.

Limitations

One limitation for the person(s) creating and implementing the computer-displayed social story intervention is the availability and knowledge of technology. The creator of the intervention must use a digital camera and computer, and have the ability to insert the digital pictures into the Microsoft Slideshow. The creator of the social story will also need to know how to create and work the slideshow program. In addition, teachers or other professionals who will be working with the student may need some technical training on how to use the Microsoft Slideshow software.

Second, follow-up data on the subject were not collected after the intervention process was completed. Therefore, it is not known if the subject continued to display the appropriate targeted behaviors after the social story intervention was no longer implemented. Nor do we know if the subject was able to generalize targeted behaviors to settings outside of the school.

Thirdly, the researcher recognizes the tension between the internal and external environments, and the complexity of creating a sterile environment within the educational setting. It is difficult to tease out if the social stories would have been as effective if the social skills had not been reinforced throughout the child's school day. However, as educators we must strive for the success of each child's learning even if it is at the cost of scientific integrity.

Finally, it is this researcher's belief that treatment integrity is imperative to the success of the social story intervention. Future studies must ensure this in order for generalization of the results to occur.

Conclusion

Working collaboratively with a team to create social stories that were unique to this particular child was key to the success of the intervention. Each child with autism is unique and so should be the content of the social story. Although inappropriate touching, inappropriate greeting and invasion of others' space are common behaviors displayed by many children with autism, it is important to define each particular behavior. For example, for this particular child one inappropriate touching behavior was defined as rubbing an adult's back. For another child with autism, it may be touching a peer.

Given that children with autism are usually better at tasks that require visual-spatial and nonverbal skills (Wenar & Kerig, 2000), using the Power Point Slideshow format in combination with digital pictures that add meaning to the text of a social story is an exciting option for teaching social skills. Although past research (Gray, 1994; Swaggart & Gagnon, 1995; Simpson & Myles, 1998; Norris & Dattilo, 1999; Rowe, 1999; Rogers & Myles, 2001; Del Valle, McEarchern & Chambers, 2001; Lorimer, Simpson, Myles & Ganz, 2002) has proven social stories to be an effective intervention to teach social skills to children with autism, little research has been conducted on teaching children with autism via the computer. Future research is needed to validate the effectiveness of computer-displayed social stories across settings, behaviors

and levels of functioning. Due to the ethical dilemmas educators are faced with in the educational setting, some alternatives for future research would be to use an alternating intervention design or a complex single case design using alternative treatment and baseline data. The computer-displayed social story is fun and easy to create, it is a motivating mode of media for most children, and each social story can be individualized for every child having difficulty with social skills.

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APPENDIX A

Illustrations of Social Stories

Slide 1

My name is (student's name).

Digital picture of subject.

Slide 2

When I am at school sometimes an adult helps me with my work.

Digital pictures of adults who help the subject with work at school.

Slide 3

When an adult is helping me with my work, sometimes I want to touch them. When I touch an adult, sometimes the adult does not like it.

Digital picture of an adult who helps the subject, moving away from him and looking uncomfortable.

Slide 4

When an adult is helping me with my work at school and I want to touch them, I will put my hand on the table.

Digital picture of the subject working with an adult with his hand on the table

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Illustration 1. Touching Slideshow

Slide 1

My name is (student's name).

Digital picture of subject.

Slide 2

When I am at school I see adults.

Digital pictures of adults whom the subject sees at school.

Slide 3

Sometimes I get too close to an adult and the adult does not like it.

An icon of a stop sign.

Slide 4

When I am at school and I see an adult, I will try to stay at least one arm's length away from the adult.

Digital picture of the subject one arm's length way from an adult he works with at school.

Illustration 2. Invasion of Others' Space Slideshow

Slide 1

My name is (student's name).

Digital picture of subject.

Slide 2

When I am at school I like to greet adults.

Digital pictures of adults the subject has contact with at school.

Slide 3

When 4th grade children greet an adult at school, 4th grade children usually give a high-five or wave and say "hi".

Digital pictures of 4th grade students, familiar to subject, giving a high-five or waving and saying "hi".

Slide 4

When I greet an adult at school, I will try to give a high-five or wave and say "hi".

Digital pictures of subject giving a high five and waving and saying "hi".

Illustration 3. Greeting Slideshow

APPENDIX B

Parent/Guardian Permission Letter

Dear Parent or Guardian:

I would like to ask your permission for your son to participate in a research study I am conducting for my thesis at the University of Dayton. My research is measuring the effectiveness of using computer-displayed stories to teach social skills to children diagnosed as having autism.

A social story describes a social situation. The computer-displayed portion of the social story will be created on Microsoft Power Point in a slide show format. Digital pictures of your child will be inserted into the slide show to help cue him on what to do and not to do in a particular social situation. Current research has found that using social stories to teach social skills is a very promising intervention for children with autism. However, if at any time you and your son would like to discontinue the study we will accommodate your wishes. If you are interested, a copy of the social stories can be made for you to use at home after the conclusion of the study.

All information will be held confidential. In reporting the results of this study your son's name will be changed to secure his privacy. If you have any questions, please do not hesitate to call me at 459-2850 ext. 70305. Sherry Freudiger and I are very excited about this project and feel as though your child will gain much from this experience. Please complete the following checklist, sign and return back to school. Thanks for your consideration and I look forward to hearing back from you soon.

Sincerely,

Connie Fuller
4th Grade Teacher
Mason Intermediate Campus

Please check the appropriate lines and send back to school:

___I have read and I understand the permission letter. I give consent for my child to participate in this study.

___I give permission for the researcher to review my child's academic file and to gather any other relevant information.

Parent's Signature/Date _____

APPENDIX C

Baseline Data Collection Form

Baseline Data Collection

Date: _____
Time: 9:50-12:00

Target Behaviors	Tally Marks
Touching Adults (Rubbing an adult's arm or hand, and holding an adult's hand)	
Greeting Adults (Calling an adult by their first name and/or putting arm around adult)	
Invasion of Others' Space (Less than one arm's length away from a adult)	